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MEMOIRS

OF THE

TORREY BOTANICAL CLUB.

VOL. II.



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MEMOIRS
OF THE
TORREY BOTANICAL CLUB.

VOL. II.

No. 4

THE GENUS *POLYGALA* IN NORTH AMERICA.

BY WM. E. WHEELOCK

There being no monograph of our species of *Polygala* published since the treatment of the genus in Torrey and Gray's Flora of North America, in 1838-1840, I undertook their study about a year ago, at the suggestion of Dr. N. L. Britton. I have endeavored to see as many specimens of the species as could be found in the largest American Herbaria, and Dr. Britton has examined most of the types preserved in Europe. The American collections which I have examined are noted at the close of this paper. I would most cordially thank the gentlemen, who own or control these collections, for their kindness in allowing me to examine them. All the specimens seen are geographically recorded in the following pages, with the intention of making the work a contribution to the subject of geographical distribution, as well as a monograph of the species themselves.

The genus was published by Linnæus, in Gen. Pl. Ed. 1, p. 214, and is attributed to Dioscorides by Prof. E. L. Greene, (Fl. Fran. 93).

The following key is planned to lead to a ready determination of the species.

§ 1. Keel provided with a fimbriate or papillose crest.

† Flowers in spikes arranged in a corymb at the summit of the stem.

‡ Root-leaves long, narrow, acuminate. 1. *P. cymosa*.

‡‡ Root-leaves spatulate or obovate.

* Spikes loose, flowers yellow. 2. *P. ramosa*.

** Spikes compact, flowers white. 3. *P. Baldwinii*.

†† Flowers in solitary spikes terminating the stem and branches.

‡ Root-leaves spatulate or obovate.

* 1°-2° high. 4. *P. Rugelii*.—Florida.

** 6'-1° high. 5. *P. lutea*.—L. I. to Miss.

*** 1'-6' high. 6. *P. nana*.—S. C. to L.

‡‡ Root-leaves inconspicuous or absent.

* Leaves verticillate, at least those below the middle of the stem,
(except in *P. Boykinii*, var. *sparsifolia*).

Spikes ovoid, compact.

o Spikes sessile or nearly so; wings deltoid-acuminate or
deltoid-ovate. 7. *P. cruciata*.

oo Spikes peduncled; wings lanceolate-ovate. 8. *P. brevifolia*.

Spikes ovoid-apiculate, loose. 9. *P. Hookeri*.

Spikes conical.

o Spikes 2"-3" in diameter at base, lower leaves obovate,
elliptical, lanceolate or linear-lanceolate. 10. *P. Boykinii*.

oo Spikes 1"-2" in diameter at base, all the leaves subulate-linear
or acicular. 11. *P. leptostachys*.

** Leaves verticillate and alternate.

Verticillate leaves predominating; spikes dense. 12. *P. verticillata*.

Alternate leaves predominating; spikes slender, loose. 13. *P. ambigua*.

*** Leaves all alternate.

Petals united into a conspicuous, slender, cleft tube 3"-4" long.

14. *P. incarnata*.

Petals not united into a conspicuous tube.

o Leaves reduced to scales. 15. *P. setacea*.

oo Leaves never reduced to scales.

□ Spikes slender, 1"-2" in diameter, often becoming much elongated and
loose, leaves acicular, bracts deciduous. 16. *P. leptocaulis*.

□□ Spikes ovoid to globose.

△ Leaves linear to linear-oblong.

|| Bracts persistent.

+ Spikes blunt, wings broadly ovate, imbricated.

17. *P. viridescens*.

- + + Spikes more or less apiculate, wings narrowly ovate or elliptical. 18. *P. Curtissii*.
 - || || Bracts deciduous. 19. *P. Mariana*.
 - △△ Leaves acicular, bracts persistent. 20. *P. Chapmanii*.
 - Spikes cylindrical.
 - △ Leaves small, 2"-6" long, oblanceolate to linear. 21. *P. Nuttallii*.
 - △△ Leaves lanceolate. 22. *P. Senega*.
 - Spikes conical. 23. *P. alba*.
 - +++ Flowers in racemes.
 - ‡ Leaves subulate-linear.
 - * Mature capsule obscurely half-winged, or wingless. 24. *P. scoparia*.
 - ** Mature capsule distinctly half-winged. 25. *P. hemipterocarpa*.
 - ‡‡ Leaves oblanceolate to oblong. 26. *P. polygama*.
 - ++++ Flowers large, 1-4, axillary, but apparently terminating the stem. 27. *P. paucifolia*.
- § 2. Keel with no proper crest, but furnished with a solitary, beak-like process.
- + Flowers 2"-3" long.
 - ‡ Beak slender, almost filiform, about ½" long.
 - * Leaves oval to lanceolate. 28. *P. Lindheimeri*.
 - ** Leaves linear-lanceolate to linear. 29. *P. Tweedyi*.
 - ‡‡ Beak short, conical, blunt, or represented by a mere ridge; branches spinose. 30. *P. acanthoclada*.
 - †† Flowers 4"-6" long.
 - ‡ Beak blunt.
 - * Branches often spinose. 31. *P. subspinosa*.
 - ** Branches spineless.
 - ‡‡ Leaves canescent. 32. *P. Rusbyi*.
 - ‡‡‡ Leaves glabrous or puberulent. 33. *P. Californica*.
 - ‡‡ Beak acicular. 34. *P. cornuta*.
- § 3. Keel without crest or beak.
- † Flowers solitary, scattered. 35. *P. macradenia*.
 - †† Flowers in racemes.
 - ‡ Leaves broadly ovate to ovate-lanceolate. 36. *P. ovatifolia*.
 - ‡‡ Leaves linear-lanceolate to lanceolate.
 - * Wings obovate; style curved. 37. *P. puberula*.
 - ** Wings circular-deltoid; style bent at an acute angle. 38. *P. grandiflora*.

1. *P. CYMOSA*, Walter, Fl. Car. 179, (1788).*P. corymbosa*, Michx. Fl. Bor. Am. ii. 54, in part, (1803.)*P. graminifolia*, Poir., in Lam. Encycl. v. 500, (1804).*P. attenuata*, Nutt. Genera, ii. 90, (1818).*P. acutifolia*, Torr. and Gray, Fl. N. A. i. 128, (1838).

Glabrous throughout; stem erect, 2°-4° high, simple below, corymbosely branched at the summit; root-leaves rosulate, long, narrow, acuminate, 2'-6' long, 1"-4" broad, stem-leaves alternate, few, scattered, narrowly linear, smaller and subulate toward the summit; corymbs simple or compound; spikes ovoid or cylindrical, 3"-6" in diameter, bracts persistent; pedicels about 1" long; flowers yellow, becoming blackish-green when dried, wings elliptical or narrowly obovate, mucronate, nearly 2" long, crest of keel consisting of a few small processes; stamens eight in number; style somewhat broadened at the middle and prolonged above into a curved, tufted appendage, stigmatic gland short-pedicelled; capsule minute; mature seeds brown, minute, globose, glabrous, without caruncle.

Delaware.—Ellendale, 1874, Canby. *South Carolina*.—Elliott; Santee Canal, Ravenel. *Georgia*.—Nuttall, Baldwin. *Florida*.—Chapman, Dr. Leavenworth, Mary C. Reynolds; near Jacksonville, A. H. Curtiss, No. 511; near Mayport and Jacksonville, 1870-1876, Henry D. Keeler; near St. Marks, 1843, Rugel; Polk Co., 1880, J. D. Smith; Indian River, 1874, Palmer, No. 23; Apalachicola, 1867, Dr. B. F. Saurman; Tampa, 1876, Dr. A. P. Garber. *Mississippi*.—Ocean Springs, 1889, S. M. Tracy; near Mississippi City, Harrison Co., 1885, J. D. Smith. *Louisiana*.—New Orleans, Drummond.

Type in Herb. Walter, British Museum Natural History, labelled "Polygala." N. L. B.

2. *P. RAMOSA*, Elliott, Fl. S. C. and Ga. ii. 186, (1824), ex descr.*P. cymosa*, Poir. in Lam. Encycl. v. 500, (1804), not Walter.*P. corymbosa*, Nutt. Genera, ii. 89, (1818), not Michx.

Glabrous throughout; stem erect, 6'-18' high, simple or branching, leafy, corymbosely branched at the summit; root-leaves rosulate, spatulate or obovate, $\frac{1}{2}$ '-1' long, stem-leaves alternate, scattered, narrowly spatulate, oblanceolate and lanceolate from below upwards, small; corymbs compound; spikes ovoid, less than 6" in diameter; pedicels about 1" long; flowers yellow, becoming blackish when dried; wings ovate-lanceolate, acuminate, about $1\frac{1}{2}$ " long; crest of keel small, fimbriate; stamens eight in number; style small, slender, slightly broadened and auriculate on either side of the minute, almost sessile stigmatic gland and prolonged above into a short, tufted, in some cases two-lobed appendage; capsule minute; seeds dark brown, minute, ovoid, minutely hairy, the two caruncle-lobes scale-like, covering the extremity of the seed only.

Delaware.—Nuttall; Felton, 1867 and 1874, Canby; Ellendale, 1875, Herb. Canby. *N. Carolina*.—Rowan Co., 1890, A. A. Heller; Wilmington, Curtis. *S. Carolina*.—Ravenel, Elliott; Bluffton, Beaufort District, 1873, 1886 and 1887, Dr. Mellichamp; Sumter Co., 1884, J. D. Smith; Columbia, Dr. Gibbs; Florence, 1878, Herb. Canby; near Charleston, Dr. Bachman; Santee Canal, Ravenel. *Georgia*.—Le Conte, Dr. Harden. *Florida*.—Herb. Chapman, Mary C. Reynolds, LeConte; Miami, 1877, Dr. Garber; Tampa, 1876, Dr. Garber; near Jacksonville, A. H. Curtiss, No. 522; near Mayport and Jacksonville, 1870-1876, Henry D. Keeler; Indian River, 1874, Palmer, No. 24; Apalachicola, 1867, Dr. Saurman. *Mississippi*.—Ocean Springs, 1890, Miss Skeehan. *Louisiana*.—Hale, Carpenter, Tainturier; Covington, T. Drummond, No. 99; New Orleans, 1832, T. Drummond, No. 37. *Texas*.—Dr. Leavenworth.

3. P. BALDWINII, Nutt. Genera, ii. 90, (1818).

Glabrous throughout; stem erect, 1°-2° high, simple, or branching above, corymbosely branched at the summit; root-leaves spatulate or obovate, $\frac{1}{2}$ '-1' long, stem-leaves alternate, scattered, the lower ones narrowly spatulate, $\frac{3}{4}$ ' long,

the upper lanceolate and shorter; corymbs simple or compound; spikes ovoid or globose, compact, 3"-6" in diameter; flowers white, almost sessile, wings nearly 2" long, ovate-lanceolate, contracted above into a long narrow point, crest of keel minute, fimbriate; stamens eight in number; style much as in the preceding species; capsule minute; seeds dark brown, minute, ovoid, hairy, the two caruncle-lobes very minute, scale-like.

Georgia.—LeConte. *Florida*.—Dr. Baldwin, (type), Herb. Chapman, Mary C. Reynolds, Buckley, Herb. Canby; near Jacksonville, A. H. Curtiss, No. 504; near Mayport and Jacksonville, 1870-1876, Henry D. Keeler; Apalachicola, 1867, Dr. Saurman; Hibernia, 1869, Canby; Rosewood, 1876, Dr. Garber; Tampa, 1876, Dr. Garber; near St. Marks, 1843, Rugel; Indian River, 1874, Palmer, No. 25; Pine Key.

Type in Herb. Acad. Nat. Sci. Phila.

Var. *CHLORGENA*, T. and G. Fl. N. A. i. 129, (1838).

Flowers becoming green when dried.

Florida.—Everglades, Miami, 1877, Dr. Garber.

4. *P. RUGELII*, Shuttleworth, in Chapm. Fl. S. U. S. Suppl. 613, (1882).

P. Reynoldsia, Chapm. loc. cit. (1882).

Glabrous throughout; stem erect or ascending, 1⁰-2⁰ high, simple or branching, somewhat angled above; root-leaves and lower stem-leaves 1'-2' long, spatulate, the rest smaller, lanceolate and acute, alternate; spikes long-peduncled, ovoid or globose, 6"-9" in diameter, compact; flowers yellow, becoming dark blue when dried, wings obovate or obovate-elliptical, about 3½" long, cuspidate, more or less distinctly 7-9 veined, crest of keel consisting of a few short, thick processes, some of which are more or less bifid; stamens eight in number; style rather long and slender, auriculate above the middle on either side of the long pedicelled somewhat pendulous stigmatic gland, and prolonged above into a tufted appendage; capsule small, seeds small, obovoid,

slightly curved, hairy, brownish, the two caruncle-lobes broad, spongy, almost as long as the seed itself.

The validity of *P. Reynoldsia*, Chapman, is doubted by the collector. The plant seems to me to be a stout form of the above.

Type of *P. Rugelii* in Herb. Kew. Authentic specimen of *P. Reynoldsia* in Herb. Col. Coll.

Florida.—Buckley, Dr. B. Smith, Palmer; Manatee, 1845, Rugel, No. 26; Manatee Co., 1887, Dr. Rothrock; Tampa Bay, 1839, Dr. Leavenworth; Tampa, 1877 and 1878, Dr. Garber, No. 11; Lake Monroe, 1876, Dr. Garber; Polk Co., 1880, J. D. Smith; Mosquito Lagoon, A. H. Curtiss, No. 522,* near St. Augustine, 1882, Miss Mary C. Reynolds, (dist. as *P. Reynoldsia*, Chapman); near St. Augustine, Miss Flint, (dist. as *P. Reynoldsia*, Chapman).

5. *P. LUTEA*, L. Spec. Pl. 705, (1753).

P. pseudo-senega, Bertol. Bot. Misc. xv. 21, t. 3, f. 2. (1854)., fide Gray in Am. Jour. Sci. ii. 24, 287.

Glabrous throughout; stems ascending, flexuous, 6'-12, high, simple or branched, more or less striate; root-leaves rosulate, spatulate, $\frac{1}{2}$ '-2' long, or, in some cases, few, broadly spatulate, smaller; stem-leaves alternate, oblanceolate or lanceolate, $\frac{1}{2}$ '-1 $\frac{1}{2}$ ' long, the lower ones obtuse, the upper acute; spikes ovoid or globose, 6"-9" in diameter, compact; pedicels 1"-1 $\frac{1}{2}$ " long; flowers orange-yellow, wings obovate-elliptical, cuspidate, 2"-3" long, about 7-veined, crest of keel small, fimbriate; stamens eight in number; style rather long and slender, minutely cucullate above the middle around and above the distinctly pedicelled stigmatic gland and prolonged above into a slender, slightly curved, tufted appendage; capsule small; seeds dark-brown, long-ovoid, small, slightly hairy, somewhat curved, minutely beaked, the two caruncle-lobes narrow, almost as long as the seed.

New York.—Long Island, Babylon, 1868, Herb. James S. Merriam. *New Jersey*.—Pine barrens, 1856, Dr. Short; Burlington, S. W. Conrad; Bordentown, 1876, Dr. Porter;

Camden Co., 1867, C. F. Parker; Atlantic Co., 1886, C. E. Smith; near Quaker Bridge, 1860, D. C. Eaton. *Pennsylvania*.—Bristol, 1866, J. C. Martindale. *Delaware*.—Wilmington, Wm. M. Canby. *Maryland*.—Salisbury, 1863, Herb. Canby; Eastern Shore of Maryland and Virginia, Canby. *South Carolina*.—Bluffton, 1873, Dr. Mellichamp. *Georgia*.—Capt. LeConte, 1840; Savannah, Mrs. Say. *Florida*.—Chapman, Dr. Edw. Palmer; near Jacksonville, A. H. Curtiss, No. 517; St. John's Co., 1879, J. D. Smith; St. John's Co., Pellicier's Creek, 1882, J. D. Smith; Hibernia, 1869, Canby; Lake Monroe, 1876, Dr. Garber; Palatka, 1876, Dr. Garber; near Mayport and Jacksonville, 1870-1876, H. D. Keeler. *Alabama*.—1846, F. M. Reese; Mobile, 1845, Sullivant. *Mississippi*.—Ocean Springs, 1890, Miss Skeenan.

Type in Herb. Linn. Good flowering specimens from Kalm. N. L. B.

6. *P. NANA* (Michx.), D. C. Prodr. i. 328, (1824).

P. lutea, var. *nana*, Michx. Fl. Bor. Am. ii. 54, (1803).

P. viridescens, Walter, Fl. Car. 178, (1788). Nutt. Gen. era, ii. 88, (1818), not L.

Glabrous throughout, low; stems, in most cases several although occasionally single, ascending, curved, 1'-6' high, more or less striate; root-leaves rosulate, spatulate; stem-leaves wanting or few, alternate, scattered, narrowly spatulate or oblanceolate, cuspidate; spikes compact, cylindrical, ovoid or globose, 3"-6" in diameter and $\frac{1}{2}'$ -1 $\frac{1}{2}'$ long, minutely squarrose with the acuminate tips of the wings, in some cases the young spikes smaller and short-conical; flowers nearly sessile, yellow or yellowish-green, becoming black or greenish-black when dried, wings ovate-lanceolate, long-acuminate, about 2 $\frac{1}{2}"$ long; crest of keel composed of several long, narrow, acute processes, some of them bifid; stamens usually six in number; style slender, somewhat curved, minutely cucullate near the summit around and above the sessile, or nearly sessile, stigmatic gland, and tufted above, appendage short, tuft almost sessile; capsule small; seeds

small, obovoid, dark brown, hairy, curved, conspicuously beaked, the two caruncle-lobes narrow, diverging, $\frac{2}{3}$ the length of the seed.

South Carolina.—Nuttall, 1824, ex. Herb. J. Gay. *Georgia*.—LeConte, Boykin, Dr. Bacon. *Florida*.—1843, Rugel; 1874, Mary C. Reynolds; Chapman, No. 18; Polk Co., Fort Meade, 1880, J. D. Smith; St. John's Co., 1879, J. D. Smith; Manatee, 1878, Dr. Garber; Miami, 1877, Dr. Garber; Hibernia, 1869, Canby; Indian River, 1874, Dr. Edw. Palmer, No. 27; Duval Co., 1882, J. D. Smith; St. John's River, 1872, Dr. Torrey; near Jacksonville, A. H. Curtiss, No. 518; near Mayport and Jacksonville, 1870-1876, Henry D. Keeler. *Alabama*.—Mobile, 1845, Sullivant. *Mississippi*.—1888, S. M. Tracy; 1885, A. B. Langlois. *Louisiana*.—Hale; New Orleans, Dr. Ingalls; Feliciana, Carpenter. *Arkansas*.—Dr. Leavenworth.

Type of *P. lutea*, var. *nana*, Michx. in Herb. Michaux; fide Torr. and Gray.

7. *P. CRUCIATA*, L. Spec. Pl. 706, (1753).

P. cuspidata, Hook. Journ. Bot. i. 194, (1834), not D. C.

Glabrous throughout; very variable in size; stem erect or ascending, 4'-16' high, more or less distinctly 4-angled, simple or branched, stout or slender; leaves verticillate in fours, or, in some cases, in fives, variable in size and shape, $\frac{1}{4}'$ - $1\frac{1}{2}'$ long, linear, oblanceolate, spatulate, or even narrowly elliptical, more or less distinctly resinously punctate; spikes sessile or upon very short peduncles, ovoid, or in some cases almost cylindrical, compact, 3"-9" in diameter, usually conspicuously squarrose with the acuminate tips of the wings; bracts persistent; flowers greenish-purple, pink, or almost white; pedicels about 1" long; wings conspicuous, deltoid-acuminate or deltoid-ovate, $1\frac{1}{2}''$ - $2\frac{1}{2}''$ long; crest of keel small, consisting of a few short and rather thick processes, stamens eight in number, style rather slender, somewhat curved, minutely cucullate above the middle, above and around the short pedicelled stigmatic gland, and terminating

above in a short, slender, curved, minutely tufted appendage; capsule small; seeds dark brown, small, obovoid, slightly curved, sparsely hairy, the two caruncle-lobes narrow, almost as long as the seed.

Maine.—Wells, 1880, Joseph Blake. *Massachusetts*.—Plymouth, Oakes; Manchester, Herb. Oakes; Plymouth, E. Tuckerman, Jr. (fls. almost white). *Connecticut*.—New Haven, Edgerton, D. C. Eaton; Stratford, Eaton. *New York*.—Staten Island, Tottenville, 1878, N. L. Britton; Long Island, River Head, 1877, E. S. Miller; East Hampton, 1890, Wm. E. Wheelock. *Pennsylvania*.—Read; near New Texas, 1861, J. J. Carter; near Bristol, 1865, C. F. Parker; Delaware Co., Tinicum, Dr. G. Smith; Lanc. Co., Smithville, 1862, T. C. Porter, 1889, J. K. Small, 1889, A. A. Heller. *New Jersey*.—Nuttall, Torrey, Gray, Jackson, 1844, ex Herb. Dr. G. Watson; Long Branch, 1852, Dr. Short; Atlantic Co., 1865, C. F. Parker; Secaucus, 1864, ex Herb. T. F. Allen; Egg Harbor, 1888, Dr. J. B. Brinton; Cape May, 1889, Dr. J. B. Brinton; Tom's River, 1867, C. F. Parker; 1870, Thos. C. Porter; Secaucus Swamp, 1864, Wm. H. Leggett. *Delaware*.—Felton, 1867, Herb. Canby. *Maryland*.—Stockton, 1889, H. H. Rusby; Maryland and Virginia, Canby. *West Virginia*.—Webster Co., Upper Glade, 1890, Dr. C. F. Millspaugh, No. 541. *Kentucky*.—Mts., 1835, Dr. Short; "knobs about Crab Orchard," Dr. Short. *North Carolina*.—Henderson Co., 1881, J. D. Smith. *South Carolina*.—Santee Canal, Ravenel; Bluffton, 1874, Dr. J. H. Mellichamp; Greenville Co., 1881, J. D. Smith. *Georgia*.—1840, Asa Gray; Tallulah Falls, 1846, Porter. *Florida*.—Chapman, Mrs. Meehan, Lt. Alden; New Smyrna, 1874, Dr. Palmer, No. 30; near Mayport and Jacksonville, 1870-1876, Henry D. Keeler; Duval Co., A. H. Curtiss, No. 509; Quincy; Apalachicola. *Alabama*.—Gates; Gadsden, 1878, G. R. Vasey. *Louisiana*.—Tainturier; Alexandria, Hale. *Minnesota*.—1848, Dr. C. C. Parry; St. Croix, 1861, ex Herb. T. J. Hale; Hennepin Co., 1889, J. H. Sandberg. "Am. Sept. (Pursh's specimen)," in Herb. Phil. Acad. Nat. Sciences.

Type of "*Polygala foliis quaternis*," Gronov., on which the species is based, in Herb. Mus. Brit. N. L. B.

8. *P. BREVIFOLIA*, Nutt. Genera, ii. 89, (1818).

P. cruciata, Torr. and Gray, Fl. N. A., i. 127, (1838), in part.

Glabrous throughout; stem erect or ascending, often slender, weak or flexuous, more or less angled, 8'-2' high, branched, or in some cases simple; leaves verticillate, except in some cases the upper ones, usually in fours, much like those of the preceding but often thinner and more conspicuously black-punctate; spikes ovoid, about $\frac{1}{2}$ ' in diameter, in some cases slightly apiculate, rather compact, peduncled, peduncles often long; bracts persistent; wings lanceolate-ovate, mucronate, the mid-vein thickened and prominent at the tip, or, in some cases, almost pointless, in other respects the flowers much as in the preceding species; stamens eight in number; capsule and seeds much as in the preceding species.

New Jersey.—Nuttall, (type), Dr. Torrey, A. Gray; Pine Barrens, 1820, Dr. Torrey, in company with Mr. Nuttall, (dist. as *P. fastigiata*, Nutt.); Hammonton, 1890, Dr. J. B. Brinton; Brown's Mills, 1864, Diffenbaugh; Atsion, 1867, C. F. Parker; Tom's River, 1874, C. F. Parker; Pine cottage, S. W. Conrad; "Head waters of Aucocas, 4 miles south of Hanover Furnace," S. W. Conrad, (dist. as *P. cruciata*, Pursh.); Quaker Bridge, 1866, E. Diffenbaugh; Quaker Bridge, 1861, Herb. Canby; Forked River, 1889, Dr. N. L. Britton; Secaucus, T. F. Allen. *Florida*.—Chapman. *Mississippi*.—Ocean Springs, 1889, S. M. Tracy, (dist. as *P. cruciata*, L.).

Type in Herb. Acad. Nat. Sci. Phila.

9. *P. HOOKERI*, Torr. and Gray, Fl. N. A., i. 671, (1840).

P. attenuata, Hook. Journ. Bot. i. 195, (1834), not Nuttall.

Glabrous throughout; stem rather slender, weak, erect, more or less distinctly 4-angled, 6'-12' high, in most cases

much branched, occasionally simple; stem-leaves verticillate, usually in fours, the lower ones very small, 1"-2" long, the rest 3"-6" long, linear, acute, in some cases indistinctly resinously punctate, those upon the branches often alternate, scattered; spikes rather long-peduncled, ovoid-apiculate, loose, $\frac{1}{4}$ '- $\frac{1}{2}$ ' in diameter; bracts persistent; flowers pale rose-color, the lower ones on pedicels about 1" long; wings almost 2" long, ovate-lanceolate, mucronate, about 6-veined and having in each tip a small ovoid callosity with a more or less cordate base; crest of keel small, fimbriate; stamens eight in number; style much as in *P. cruciata*; capsule small; seeds small, ovoid, hardly curved, dark brown, sparsely hairy, the two caruncle-lobes as long as, or even longer than, the seed.

Florida.—Chapman; Apalachicola, Herb. Chapman; 1867, Dr. B. F. Saurman. *Alabama*.—Baldwin Co., C. Mohr. *Mississippi*.—Ocean Springs, 1889, S. M. Tracy. *Louisiana*.—New Orleans, Drummond; Jacksonville, Drummond, No. 131.

Type in Herb. Kew. N. L. B.

10. P. BOYKINII, Nutt. in Journ. Acad. Phil. vii. 86, (1834).
P. bicolor, Hook. Journ. Bot. i. 194, (1834).

Glabrous throughout; stems usually several, erect, or curved and ascending, 1°-2° high, more or less angled, or striate, often slender, simple or branched above; stem-leaves verticillate, at least those below the middle of the stem, in fours or fives, the lower obovate, about $\frac{1}{4}$ ' long, the rest $\frac{1}{2}$ '-1' long, elliptical, lanceolate, or linear-lanceolate, often cuspidate; upper stem-leaves, as well as those upon the branches, in many cases, alternate, narrow; spikes conical, 2"-3" in diameter at the base, 1'-3' in length, long-peduncled; bracts deciduous; flowers white, or greenish-white, almost sessile, wings broad-ovate, obovate, or almost circular in outline, concave, about 1" long; crest of keel small, made up of a few rather broad processes; stamens eight in number; style short, minutely auriculate on either side of the pedicelled stigmatic

gland and terminating above in a short, curved, tufted appendage; mature capsule $1\frac{1}{2}$ "-2" long; seeds obovoid, curved, very hairy, the two caruncle-lobes broad, often overlapping one another, $\frac{1}{2}$ - $\frac{3}{4}$ the length of the seed, or, in some cases, longer.

Georgia.—1830, Boykin, (type); 1835, Dr. Short; Monticello Co., 1846. *Florida*.—Dr. Chapman, A. P. Garber; Aspalaga, Herb. Chapman; near Chattahoochee, A. H. Curtiss, No. 605, (or 506)?; near Appalachicola, ex Herb. C. Mohr; Pine Key, Mr. Blodgett; Sarasota, 1876, Dr. A. P. Garber; "Florida and Alabama," 1833, Rugel. *Alabama*.—Mr. Buckley; 1855, Hatch; Asheville, 1878, G. R. Vasey, No. 85; Tuscaloosa, 1883, C. Mohr; Perry Co., 1885, J. D. Smith; near Blount Springs, 1884, J. D. Smith; Blount Co., 1884, J. D. Smith, (the axis of inflorescence marked with the scars of fallen bracts for a distance of six inches.) *Mississippi*.—"Lake," S. M. Tracy; Brookhaven, 1882, Miss M. B. Flint. *Louisiana*.—New Orleans, 1833, Drummond, No. 36.

Type in Herb. Acad. Nat. Sci. Phila.

Var. SPARSIFOLIA, n. var.

$1\frac{1}{2}$ "-2" high; branching irregularly, leaves small, 2"-6" long, about 1" broad, cuspidate, few, scattered, alternate, the lowest of all in some cases verticillate.

South Florida.—Cudjoe Key, (coral soil), A. H. Curtiss, No. 503,* (dist. as *P. ambigua*, Nutt. var.)

Type in Herb. Col. Coll.

11. *P. LEPTOSTACHYS*, Shuttl. in A. Gray's Pl. Wright. i. 41, (1852).

Glabrous throughout; stem usually single, erect, straight or slightly curved, slender, 1° - $1\frac{1}{2}^{\circ}$ high, simple or with one or two filiform branches near the summit; stem-leaves verticillate in fours or fives, subulate-linear or acicular, 2"-8" long, the whorls far apart, few; spikes narrowly conical, 1"-2" in diameter at the base, about 6" long, or becoming longer later; bracts deciduous; flowers greenish, almost sessile, wings oval, obtuse, less than 1" long, shorter than the mature

capsule; crest of keel minute, consisting of a few short, thick processes; stamens eight in number; style minute, cucullate or auriculate above and on either side of the pedicelled stigmatic gland, the terminal tufted appendage short, filiform; mature capsule about 1" long; seeds dark brown, small, clavate or clavate-obovoid, curved, smooth, or slightly hairy at the broader end, papillose, the two caruncle-lobes narrow, oblanceolate, $\frac{1}{2}$ - $\frac{3}{4}$ the length of the seed.

Florida.—Herb. Chapman; 1828, Dr. Leavenworth; near Aspalaga, 1843, Rugel, (type); near Jacksonville, A. H. Curtiss, No. 516; Duval Co., 1876, A. H. Curtiss; Gainesville, 1876, Dr. A. P. Garber; "Sand hills," Herb. Chapman, (dist. as *P. attenuata*, Hook.?). Type in Herb. Col. Coll.

12. *P. VERTICILLATA*, L. Spec. Pl. 706, (1753).

Glabrous throughout; stem erect, straight or flexuous, 2'-10' high, angled, branched, very variable as to size and habit, short, stout, with spreading branches, or taller, more slender, with branches more or less fastigiate; leaves linear-lanceolate to linear, acute, $\frac{1}{2}$ '-1' long, those of the stem in most cases verticillate in fours or fives, while those upon the branches, and frequently some upon the stem also, are alternate; spikes conical, 2"-3" in diameter at the base, $\frac{1}{4}$ '-1' long; peduncles in the short, stout forms short, in the taller forms somewhat elongated; bracts deciduous; flowers greenish-white, on very short pedicels, wings broadly ovate, about $\frac{1}{2}$ " long, not venose, only the mid-vein conspicuous; crest of keel small, made up of several rather short and thick processes; stamens eight in number; style very short and small, the tufted appendage minute, filiform; the mature capsule about 1" long, apparently much longer than the wings, which at this stage are not as a rule closely appressed to it but are twisted or reflexed so as to leave the capsule more or less uncovered; seeds small, narrowly obovoid or obovoid-clavate, dark brown, hairy, or in some cases glabrous, the two caruncle-lobes narrow, collateral or diverging, about half as long as the seed.

Canada.—Manitoba, Griswold, 1887, W. A. Bunnan, (a small form only 2'-3' high); Ontario, near Queenston Heights, 1877, Macoun, No. 377; Saskatchewan, 1858, Bourgeau; Niagara Falls, ex Herb. Macnab. *Maine*.—Mt. Desert Island, S. W. Harbor, 1887, E. L. Rand; Orono, 1889, M. L. Fernald. *New York*.—Dr. Devan; Penn Yan, Dr. Sartwell; West Point, 1887, N. L. Britton; Coney Island, 1887, N. L. Britton; Staten Island, New Dorp, 1890, N. L. Britton. *Massachusetts*.—Essex Co., Herb. Oakes. *Pennsylvania*.—Dr. Griffith; Philadelphia, 1824, "Nuttall misit;" Lancaster Co., Safe Harbor, 1864, T. C. Porter; Lehigh Co., Slatington, 1868, R. G. Bechdolt; Perry Co., Marysville, 1888, T. C. Porter; Huntingdon Co., J. R. Lowrie; vicinity of Conewago, 1889, J. K. Small; Easton, Dr. Traill Green; Bethlehem, 1832, C. J. Moser. *New Jersey*.—Rosemont, 1883, Thos. C. Porter, 1886, G. N. Best; above Phillipsburg, 1882, T. C. Porter; Bergen Co. and Hudson Co., 1890, M. Timmerman; Morris Co., Port Oram, 1886, N. L. Britton; near Ironia, N. L. Britton; near Lake Hopatcong, 1886, N. L. Britton; Sussex Co., near Andover, 1887, N. L. Britton; Sparta, N. L. Britton. *Delaware*.—Herb. Wm. M. Canby. *Maryland*.—Stockton, 1889, H. H. Rusby. *Georgia*.—Jasper Co., 1846, T. C. Porter. *Florida*.—Rosewood, 1876, Dr. A. P. Garber. *Texas*.—Chas. Wright, Drummond, No. 26; Tom Greene Co., 1879, Frank Tweedy; Hempstead, 1872, Elihu Hall, Nos. 91 and 92. *Indian Territory*.—1868, Dr. Edward Palmer. *Arkansas*.—Dr. Pitcher, ex Herb. F. L. Harvey, No. 101. *Tennessee*.—Base of Chilhowee Mts., A. H. Curtiss, No. 503 (in part). *Kentucky*.—Greenville, 1840, Dr. Short. *Illinois*.—Beardstown, 1842, Geyer. *Wisconsin*.—Lacrosse, 1861, "ex coll. T. J. Hale." *Kansas*.—Miami Co., 1884, Dr. J. H. Oyster. *Dakota*.—Black Hills, 1887, Dr. W. H. Forwood. *Wyoming*.—Yellowstone Park, 1884, Tweedy, No. 308. *Colorado*.—"North of Denver, on Clear Creek," 1870, E. L. Greene, No. 66. *Utah*.—N. of Am. Fork Cañon, Hayden's Survey, 1877; J. D. Hooker and A. Gray.

Type in Herb. Linn. Specimens from Kalm. N. L. B.

13. *P. AMBIGUA*, Nutt. Genera, ii. 89, (1818).

P. verticillata, L. var. *ambigua*, Wood, Bot. and Flor. 80, (1870).

Much resembling the preceding, but taller, 5'-16' high, generally more slender and the branches more fastigiate; while the lower stem-leaves are in many cases verticillate most of the leaves of the plant are alternate; spikes, as a rule, longer than in the preceding, less compact, the flowers at the base of the spike often quite distant from each other; the peduncles often several inches in length; flowers rather larger, wings often purple, somewhat circular in outline, venose, the mid-vein and two lateral veins noticeable; mature capsule apparently less elongated, hardly longer than the wings which are more or less closely appressed to it so as to conceal it from view.

New Jersey.—Nuttall. (type). *Pennsylvania*.—1836, H. Detwiller; near Philadelphia, Herb. Phil. Acad. Nat. Sci.; Chester Co., 1889, Witmer Stone; Mercersburg, 1844 and 1850, Herb. Porter; Philadelphia, 1824, "Nuttall misit," in Herb. Gray; Columbia Co., Buckhorn, 1889, A. A. Heller; Chester Co., W. Nottingham, 1889, T. C. Porter; Chester Co., Lincoln, 1887, T. C. Porter; Chester Co., Corcoranville, 1883, Dr. J. B. Brinton; Lancaster Co., 1861, T. C. Porter, Smithville, 1865, T. C. Porter. *Delaware*.—1862, Herb. Wm. M. Canby. *Maryland*.—Garrett Co., 1879, J. D. Smith. *Virginia*.—Natural Bridge, 1885, Dr. and Mrs. N. L. Britton. *West Virginia*.—Wood Co., 1890, Dr. C. F. Millspaugh. *Kentucky*.—Mudlick, Dr. C. W. Short; Greenville, 1840, Dr. C. W. Short; "Hills about Crab Orchard," 1835, Dr. Robert Peter. *Tennessee*.—Grainger Co., 1880, J. D. Smith; base of Chilhowee Mts., A. H. Curtiss, No. 503 (in part). *Georgia*.—Herb. Chapman. *Alabama*.—La Grange, Prof. Hatch. *Louisiana*.—Hale.

Type in Herb. Acad. Nat. Sci. Phila.

14. *P. INCARNATA*, L. Spec. Pl. 701, (1753).

More or less glaucous; stem erect or ascending, usually

somewhat curved, 1°-2° high, simple or sparingly branched; leaves alternate, few, scattered, $\frac{1}{4}'$ - $\frac{1}{2}'$ long, linear-subulate, the upper ones often very small; spikes somewhat cylindrical, $\frac{1}{2}'$ - $1\frac{1}{2}'$ long, $\frac{1}{4}'$ - $\frac{1}{2}'$ in diameter; bracts deciduous; flowers pale purple or rose color, almost sessile; wings about 2" long, lanceolate, minutely mucronate, about five-veined, conduplicate at the tip; petals united into a conspicuous, slender, cleft tube, 3"-4" long, two or three times as long as the wings; crest of keel conspicuous, made up of several broad and thin processes, some of which are bifid; stamens eight in number; style long, filiform, curving above, auriculate near the summit on either side of the almost sessile stigmatic gland and terminating above in a rather short, tufted appendage; mature capsule about 2" long, cordiform-ovoid, sulcate; seeds short-ovoid, dark-brown, hairy, conspicuously beaked, the two caruncle-lobes lenticular, spongy, enveloping the beaked extremity of the seed.

New Jersey.—Dr. C. Pickering; Haddonfield, Mr. Read; Clarksboro, 1886, ex. Herb. Isaac Burk; "New Jersey to Carolina," Nuttall; "New Jersey and Illinois," W. D; Bridgeton, Britton; near Mickleton, B. Heritage. *Pennsylvania*.—Huntingdon Co., 1843; Lancaster, Porter; New Texas, 1862, J. J. Carter. *Delaware*.—Townsend, 1862, Herb. Wm. M. Canby. *Maryland*.—Salisbury, 1865, ex. Herb. Wm. M. Canby; Stockton, 1889, H. H. Rusby. *D. C.*—Georgetown, Dr. Robbins, No. 55. *Virginia*.—Norfolk, Dana; Noels', 1889, Dr. J. B. Brinton, (an almost leafless form).

North Carolina.—Rowan Co., 1890, A. A. Heller, (an almost leafless form). *South Carolina*.—Santee Canal, Ravenel; Bluffton, 1873, Dr. J. H. Mellichamp; Society Hill, 1884, J. D. Smith; Mount Pleasant, near Charlestown, Miss Fisher. *Georgia*.—Boykin; Monticello, Jasper Co., 1846, T. C. Porter; Savannah, Mrs. Say; Bull Creek, near Columbus, 1883, J. D. Smith. *Florida*.—Herb. Chapman, F. Cozzens; Indian River, 1874, E. Palmer, No. 28; Magnolia, 1883, J. D. Smith; Fort Meade, 1880, J. D. Smith; Duval Co., 1882, J. D. Smith; A. H. Curtiss, No. 515; Jacksonville, 1869, Wm. M. Canby;

near Mayport and Jacksonville, 1870-1876, Henry D. Keeler; Apalachicola, 1867, Dr. Saurman. *Alabama*.—Conecuh Co., near Evergreen, 1884, J. D. Smith. *Mississippi*.—Ocean Springs, 1890, Miss Skeeahan. *Louisiana*.—New Orleans, 1832, Drummond. *Texas*.—1843, Lindheimer, No. 12, Chas. Wright; Washington Co., Miss Hobart; Hempstead, 1872, Elihu Hall, No. 93; Dallas, 1881, J. Reverchon. *Kansas*.—Miami Co., 1888, Dr. J. H. Oyster. *Arkansas*.—Dr. Leavenworth; Grand Prairie, 1883, F. L. Harvey, No. 3. *Kentucky*.—1842, Dr. C. W. Short; "Barrens," 1835, Dr. Short. *Illinois*.—1852, S. B. Mead; Augusta, 1842, S. B. Mead; Beardstown, 1842, Geyer; "Prairies," J. L. Darlington.

A form slender, almost leafless, with white flowers. *Florida*.—Rosewood, 1876, Dr. A. P. Garber.

A form stout and almost leafless. *Florida*.—St. George's Island, Herb. Chapman, (dist. as *P. incarnata*, var.); "Apal-sea-shores." Perhaps identical with "*P. paniculata*, herb. Le Conte," Torr. and Gray Flora, i. 129.

Type in Herb. Linn. Specimens from Kalm. N. L. B.

15. *P. SETACEA*, Michx. Fl. Bor. Am. ii. 52, (1803).

Glabrous throughout; stem single, or two or three from the same base, slender, erect, straight, or somewhat flexuous, 6'-18' high, simple, or sparingly branched; leaves represented by mere scales; spikes ovoid-conical, compact, 4"-9" long, 2"-3" in diameter; bracts deciduous; flowers pale-pink or whitish, almost sessile; wings about 1" long, narrowly obovate, hardly mucronate; crest of keel small, consisting of a few short processes; stamens six in number; style short, minutely auriculate in the middle on either side of the rather long-pedicelled stigmatic gland and terminating above in a short, curved, tufted appendage; capsule small; seeds small, ovoid, hairy, the two caruncle-lobes much as in the preceding species.

Florida.—Dr. Chapman, No. 90; Dr. Leavenworth; 1875, 1877, 1878, Mary C. Reynolds; Apalachicola, Chapman; 1867, Dr. B. F. Saurman; near Jacksonville, A H Curtiss, No. 525;

near Mayport and Jacksonville, 1870-1876, Henry D. Keeler; Indian River, 1874, Dr. Edw. Palmer, No. 29; Hibernia, 1869, Wm. M. Canby; Manatee, 1876, Dr. A. P. Garber; Tampa, 1876, Dr. A. P. Garber; 1880, J. D. Smith. "*Georgia and Florida*".—Le Conte. "Am. Sept".—Dr. Baldwin.

Type in Herb. Michaux, fide Torr. and Gray.

16. *P. LEPTOCAULIS*, Torr. and Gray, Fl. N. A. i. 130, (1838).

Glabrous throughout; stem very slender, in some cases almost filiform, erect or ascending, often curved or flexuous, 1⁰-2⁰ high, in most cases sparingly branched above, branches fastigiate; leaves alternate, acicular, few, scattered, $\frac{1}{4}$ '-1' long; spikes slender, 1"-2" in diameter, often becoming much elongated and loose; bracts deciduous; flowers pale-purple, on very short, slender pedicels, in some cases secund; wings elliptical-obovate, narrowed at the base into a short claw, $\frac{1}{2}$ "-1" long, about three-veined; crest of keel small; stamens eight in number; style minute, cucullate above the middle, the stigmatic gland almost sessile, the tufted appendage minute, filiform, in some cases the tuft sessile or the entire appendage wanting; mature capsule small, less than 1" long; seeds minute, ovoid, not curved, very hairy, the two caruncle-lobes minute, hardly to be seen.

Louisiana.—Carpenter, in Herb. Chapman; (Chateauger), 1885, A. B. Langlois; Abbeville, 1884, A. B. Langlois. *Texas*.—Buckley, 1872, Elihu Hall, Drummond, No. 28, (type); 1843, Lindheimer, No. 11; Mr. Chas. Wright; Hemstead, 1872, Elihu Hall, No. 95; Beaumont, 1884, G. C. Nealley.

Type in Herb. Col. Coll.

17. *P. VIRIDESCENS*, L. Spec. Pl. 705, (1753).

P. sanguinea, L. Spec. Pl. 705, (1753).

P. purpurea, Nutt. Genera, ii. 88, (1818).

Glabrous throughout; stem more or less angled, 6'-16' high, stout, erect, branched, leafy to the top, or slender and simple;

leaves alternate, linear to linear-oblong, $\frac{1}{2}$ '-1' long, acute, or almost cuspidate; spikes ovoid or globose, blunt, compact, $\frac{1}{2}$ '-1' long, 4" or 5" in diameter, short-peduncled; bracts persistent, but in many cases only moderately so; flowers red-purple, or in forma albiflora white, sessile, or nearly so; wings imbricated, broadly ovate, $1\frac{1}{2}$ "-3" long, about nine-veined, the mid-vein conspicuously thickened throughout the upper half of the wing, and usually prolonged into a mucronation; crest of keel very small, consisting of a few short, broad, thickish, in some cases retuse, processes; stamens eight in number; style somewhat broadened, and minutely auriculate at the middle, above and on either side of the almost sessile stigmatic gland, and terminating above in a rather stout, curved, tufted appendage; capsule small; seeds small, pear-shaped, dark-brown, hairy, the two caruncle-lobes collateral, diverging, or even straddling the seed, half as long as, or, in some cases, as long as the seed.

Canada.—Ontario, Point Pelee, 1881, Brodie; Windsor, 1884, J. M. Macoun. *Maine*.—Mt. Desert Island, near Seal Harbor, 1889, J. H. Redfield; Cape Elizabeth, 1889, M. L. Fernald.

New York.—Long Island, Hicksville, 1890, Geo. D. Hulst; Forbell's Landing, 1890, M. Timmerman. Staten Island, 1890, Oakwood, New Dorp, Court House, N. L. Britton.

Massachusetts.—Fair Haven, 1865, Dr. J. W. Robbins; Northampton, 1874, S. Watson; Cape Ann, 1883, Dr. J. B. Brinton; Salem, C. Pickering.

Rhode Island.—Providence, Olney; Little Compton, 1821, Miss Stretter.

New Jersey.—S. W. Conrad; Camden, 1876, I. C. Martindale; Gloucester Co., 1865, C. F. Parker; "Pine barrens," 1856, Dr. Short; Demarest, 1880, Herb. Joseph Schrenk. *Pennsylvania*.—1836, H. Dettwiller; Bethlehem, J. Wolle; Westchester, 1827, W. D.; Lancaster Co., Reinholdsville, 1866, Thos. C. Porter; Lanc. Co., Mastic Forge, 1861, T. C. Porter; New Texas, 1860, T. C. Porter; Mercersburg, 1850, Thos. C. Porter; Lebanon Co., Penryn, 1889, A. A. Heller; Harmons-

burg, 1869, Garber; Presque Isle, 1869, Garber; Northampton Co., 1861, Dr. T. Green; vicinity of Penryn, 1889, J. K. Small.

Delaware.—Herb. Wm. M. Canby; Wilmington, 1844, J. B. Brakely. *Maryland*.—Salisbury, Wm. M. Canby; Oakland, Garrett Co., 1880, J. D. Smith. *West Virginia*.—Wood Co., 1890, Dr. C. F. Millspaugh, No. 247.

Kentucky.—"Hills about Crab Orchard," 1835, Dr. Robert Peter; "Knobs of Crab Orchard," 1842, Dr. Short.

Ohio.—Darby Plains. *Illinois*.—Mt. Carmell, 1875, Dr. J. Schenck; Beardstown, 1842, Geyer; Fountaindale, Winnebago Co., Herb. M. S. Bebb; Augusta, 1842, S. B. Mead; Oquawka, 1874, Harry N. Patterson; "Prairies," J. L. Darlington. *Wisconsin*.—Juneau Co., Camp Douglas, 1890, E. A. Mearns, No. 250. *Minnesota*.—Hennepin Co., 1889, J. H. Sandberg. *Arkansas*.—Dr. Pitcher; Grand Prairie, 1883, F. L. Harvey, No. 11; ("N. W.") 1880, ex. Herb. F. L. Harvey, No. 68. *Kansas*.—1887, Dr. J. H. Oyster; Miami Co., 1885, Dr. J. H. Oyster. *Indian Territory*.—1868, Dr. Edw. Palmer, No. 74.

Type of both *P. viridescens* and *P. sanguinea* in Herb. Linn. N. L. B.

Forma ALBIFLORA. Flowers white. *Massachusetts*.—1860, Concord, Mr. Pratt. *Delaware*.—Townsend, 1872, ex Herb. Wm. M. Canby. *West Virginia*.—Webster Co., 1890, Dr. C. F. Millspaugh, No. 554.

Type in Herb. Col. Coll.

18. *P. CURTISSII*, A. Gray, Manual, 5th ed. 121, (1867).

Glabrous throughout; stem much as in the preceding but rather more slender; leaves alternate, linear, the upper ones acute; spikes ovoid or globose, more or less apiculate, not compact, 4"-6" in diameter; peduncles longer than in the preceding; bracts persistent; flowers rose-purple, pedicels about 1" long; wings narrowly ovate, or elliptical, minutely mucronate, about seven-veined, the mid-vein less prominent than in the preceding and thickened only at the tip; crest of keel small, made up of a few short, blunt, thickish processes,

some of which are often bifid; stamens eight in number; style much as in the preceding; capsule small; seeds small, dark-brown, densely hairy, pear-shaped or top-shaped, beaked at the smaller, and apiculate at the larger extremity, the two caruncle-lobes minute, obovate, scale-like, about $\frac{1}{4}$ the length of the seed.

This species was founded upon an abnormal form in which the pedicels are much elongated, making the inflorescence conspicuously racemose.

Before this fact was recognized specimens which would now be regarded as typical were referred to var. *pycnostachya*, Gray.

Pennsylvania.—Bethlehem, 1840, Mr. Wolle, (dist. as *P. Nuttallii*.)

Maryland.—Bladensburg, 1878, Lester F. Ward; Piney Point, 1874, George Vasey, (dist. as var. *pycnostachya*); Cecil Co., near Elkton, 1884, J. J. Carter, F. W. Price.

D. C.—Washington, 1886, H. W. Henshaw; 1874, Dr. Vasey; near Washington, 1878, 1879, Lester F. Ward. *Virginia*.—near Alexandria, 1865, Curtiss, (type); Alexandria Co., 1884, Lester F. Ward; Noels, 1890, Dr. J. B. Brinton; Richmond, 1887, Herb. Isaac Burk, (dist. as var. *pycnostachya*).

North Carolina.—1880, Thomas Meehan, T. C. Porter and others, (dist. as var. *pycnostachya*); "Mts." 1878, G. R. Vasey, (dist. as var. *pycnostachya*); "Western," 1880, Thos. C. Porter, (dist. as var. *pycnostachya*); Marion Co., (Hyams?); Jackson Co., Wild Cat Ridge, 1882, J. D. Smith, (dist. as var. *pycnostachya*); Macon Co., Horse Cove, 1882, J. D. Smith, (dist. as var. *pycnostachya*); Transylvania Co., Buck Forest, 1881, J. D. Smith, (dist. as var. *pycnostachya*); Henderson Co., 1876, ex. Herb. Wm. M. Canby; Anson Co., 1884, J. D. Smith; Rowan Co., 1890, A. A. Heller; Black Mt. Station, 1885, Dr. and Mrs. N. L. Britton; Blue Ridge, 1841, Gray and Carey.

South Carolina.—Cæsar's Head, 1876, Herb. Wm. M. Canby, 1881, J. D. Smith, (dist. as var. *pycnostachya*); "Mts. of Carolina and Georgia," 1867, A. Gray.

Georgia.—Boykin; 1875, C. Wright; 1888, Geraldus Mc-

Carthy; 1846, ex. Herb. T. C. Porter. *Alabama*.—Blount Co., 1884, J. D. Smith. *Tennessee*.—1880, A. Gattinger; Chilhowee Mt., A. H. Curtiss, No. 523, (dist. as *P. sanguinea*, L.); Grainger Co., Clinch Mt., 1880, J. D. Smith, (dist. as var. *pycnostachya*). *Kentucky*.—1840, Dr. C. W. Short, (dist. as *P. purpurea*); Licking River Hills, Short; Mudlick, C. W. Short, (dist. as *P. purpurea*); Road to Red River, Dr. Short.

Type in Herb. Gray.

19. *P. MARIANA*, Mill. Gard. Dict. No. 6, (1768).

P. fastigiata, Nutt. Genera, ii. 89, (1818).

P. sanguinea, Torr. and Gray, Fl. i. 126, (1838), excl. syn.

Glabrous throughout; erect, or ascending and flexuous, slender, or in some cases moderately stout, 6'-18' high, simple, or branched above; the branches often conspicuously overtopping the stem, in some cases fastigiate; leaves alternate, linear, 2"-8" long, acute or almost cuspidate, often rather erect, the upper ones upon the branches in many cases very small, subulate and appressed; spikes ovoid or glabose, 3"-5" in diameter; bracts deciduous; flowers rose-color, pedicels sometimes as long as 1½"; wings ovate or elliptical, almost 2" long, about five-veined, mid-vein thickened and conspicuous at the tip; crest of keel consisting of a few short, blunt processes which are often bifid; stamens eight in number; style rather long and slender, minutely auriculate above the middle, above and on either side of the almost sessile stigmatic gland, the tufted appendage curved; capsule small; seeds small, pear-shaped with rather a long neck, slightly curved, minutely apiculate at the larger extremity, dark-brown, hairy, the two caruncle-lobes short and broad, embracing the smaller extremity of the seed.

Delaware.—Townsend, 1861, Herb. Canby; Felton, 1867, Herb. Wm. M. Canby, 1874, Wm. M. Canby; Sussex Co., Ellendale, 1875, Herb. Wm. M. Canby.

Maryland.—Near Bladensburg, 1884, Lester F. Ward; Stockton, 1889, H. H. Rusby. *D. C.*—Near Washington, 1876, J. W. Chickering, Jr.

Virginia.—Portsmouth, Rugel.

North Carolina.—Herb. Phil. Acad. Nat. Sciences; Rowan Co., 1890, A. A. Heller. *South Carolina*.—Santee Canal, H. W. Ravenel; Florence, 1878, Herb. Wm. M. Canby; near Society Hill, 1884, J. D. Smith. *Georgia*.—Taylor Co., 1876, H. N. Neisler. *Florida*.—Chapman; Hibernia, 1869, Wm. M. Canby; Picolata, 1858, Wm. M. Canby; St. Augustine, 1876, Dr. A. P. Garber; Apalachicola, 1867, Dr. Saurman. *Alabama*.—Selma, Dr. Cahill. *Louisiana*.—Hale; New Orleans, 1832, "comm. Drummond;" (West), Chateigner, 1885, A. B. Langlois; (West), Atakopus, in prairies, 1885, A. B. Langlois; (East), in pine barrens, 1885, A. B. Langlois; (East), St. Tammany Co., 1885, A. B. Langlois, No. 13. *Texas*.—Mr. Charles Wright.

Type in Herb. Mus. Brit. N. L. B.

20. P. CHAPMANII, Torr. and Gray, Fl. N. A. i. 131, (1838).

Glabrous throughout; stem erect, slender, 1⁰-18' high, simple, or at length sparingly fastigiately branched; leaves alternate, acicular, 2"-9" long; spikes long-ovoid, apiculate, 3"-4" in diameter, or the younger ones short, almost conical; bracts persistent; flowers bright rose-color, or purplish, on pedicels almost 1" long; wings ovate or elliptical, minutely mucronate, nearly 1½" long, about nine-veined, the mid-vein thickened at the extreme tip; crest of keel consisting of a few, in some cases only two, minute papilloid processes; stamens eight in number; style small, minutely auriculate near the middle, above and on either side of the almost sessile stigmatic gland, the tufted appendage curved; capsule small, short; seeds small, short, pear-shaped, almost black, minutely beaked, furnished with an abundance of pale, curved hairs; the two caruncle-lobes small, short and broad, 1-5-¼ the length of the seed, and straddling its beak.

Florida.—Chapman; Walton Co., A. H. Curtiss, No. 508; West Florida, Herb. Torrey.

Alabama.—Mobile Co., 1885, Dr. C. Mohr; Mobile, 1878,

Dr. C. Mohr. *Mississippi*.—Ocean Springs, 1890, Miss Cath. Skeeahan.

Type in Herb. Col. Coll.

21. *P. NUTTALLII*, Torr. and Gray, Fl. N. A. i. 670, (1840), excl. syn.

P. sanguinea, Nutt. Genera, ii. 88, (1818), not L.

P. ambigua, Torr. and Gray, Fl. N. A. i. 130, (1838), not Nutt.

Glabrous throughout; stem erect, slender, 4'-9' high, branched, or in some cases simple; leaves alternate, 2''-6'' long, those on the stem often oblanceolate, the rest linear; spikes more or less cylindrical, often apiculate, 2''-3'' in diameter; bracts persistent; flowers greenish-purple, on very short pedicels; wings less than 1'' long, elliptical or obovate-elliptical, with a short claw, about five-veined, minutely mucronate, the mid-vein thickened at the tip; crest of keel very small, made up of a few papilloid processes; stamens eight in number; style very small, resembling that of the preceding species; mature capsule very small, shorter than broad; seeds minute, somewhat pear-shaped, dark-brown, hairy, the two caruncle-lobes about $\frac{1}{3}$ the length of the seed.

Massachusetts.—Martha's Vineyard, 1825, Oakes. *Rhode Island*.—Thurber; 1846, Thurber and Calder; Providence, Olney. *New York*.—Long Island, Cedarhurst, 1886, J. A. Bisky. *Pennsylvania*.—Lanc. Co., New Texas, 1861, J. J. Carter; Chester Co., 1889, Witmer Stone; Philadelphia, 1844, ex. Herb. Dr. G. Watson; Bethlehem, J. Wolle; Franklin Co., Mercersburg, ex. Herb. Dr. Traill Green; near Bristol, 1865, C. F. Parker; Delaware Co., Tinicum, 1866, Thos. C. Porter; Pike Co., 1870, Thos. C. Porter; Chester Co., 1889, T. C. Porter; Lancaster Co., Smithville, 1865, T. C. P. *New Jersey*.—Nuttall, (dist. as *P. sanguinea*), (type); Pine Barrens, 1834; 1856, Dr. Short; 1861, Herb. Wm. M. Canby; Egg Harbor, 1889, Dr. J. B. Brinton; bet. Eatontown and Mechanicsville, 1865, T. F. Allen; Laurence Station, 1885, Rev. J. E. Peters. *Delaware*.—1866, Canby; Townsend, 1862, Herb.

Wm. M. Canby. *Maryland*.—Wm. M. Canby. *Kentucky*.—Hooker.

Type in Herb. Col. Coll.

22. P. SENECA, L. Spec. Pl. 704, (1753).

Senega officinalis, Spach, Hist. Veg. vii. 129, (1839).

Stems, usually several from a thick rootstock, erect or ascending, straight or curved, 6'-18' high, minutely puberulent, usually simple, occasionally branching above, leafy; leaves numerous, alternate, lanceolate, or some almost linear-lanceolate, $\frac{1}{2}$ '-1 $\frac{1}{2}$ ' long, scabrous on the margin, often a few, small and scale-like, at the bases of the stems; spikes cylindrical, 1'-1 $\frac{1}{2}$ ' long, 2"-4" in diameter; flowers white or greenish-white, nearly sessile, wings circular-obovate, concave, 1"-1 $\frac{1}{2}$ " long; crest of keel small, consisting of several short, thick processes; stamens eight in number; style short, galeate, or sharply curved, appendage wanting or represented by a minute tuft of hairs; mature capsule nearly orbicular, compressed; seeds obovoid, somewhat curved, only moderately hairy, the two caruncle-lobes rather broad, collateral, about as long as the seed.

Canada.—Rocky Mts., Canmore, 1885, Macoun; Saskatchewan, 1858, E. Bourgeau, No. 40; Manitoba, Assinaboine River, 1879, Macoun; Lake Winnipeg Valley, 1837, Bourgeau; E. coast of Hudson's Bay, 1879, Dr. Robert Bell, No. 23; Ontario, Belleville, 1865, 1867, 1878, Macoun.

Dakota.—Black Hills, 1887, Dr. W. H. Forwood; near Devil's Lake, "Nicollet's northwest. exped.," 1839, Chas. A. Geyer, (a stunted form).

Minnesota.—Minneapolis, 1886, O. W. Oestlund; Hennepin Co., 1890, ex. Herb. J. H. Sandberg.

Wisconsin.—Madison, T. J. Hale.

Maine.—Aroostook, 1882, Geo. U. Hay.

Vermont.—Colchester, Oakes; Charlotte, 1877, C. G. Pringle. *New York*.—Albany, Herb. Torrey; Watertown, 1834, Dr. Gray; Penn Yan, 1852, Sartwell; near Painted

Post, 1885, ex Herb. Isabel S. Arnold; Yates Co., Wright; "Hill opp. Tioga, W."

Pennsylvania.—Chester Co., Brookfield, 1861, Herb. Wm. M. Canby; Delaware Co., 1860, 1863, Wm. M. Canby; near Frankford, Conrad; Blair Co., Hollidaysburg, 1851, J. R. Lowrie; Huntingdon Co., near Alexandria, 1844; Chestnut Hill, ex Herb. Isaac Burk; Lanc. Co., New Texas, 1863; Conewago, 1889, J. K. Small.

Maryland.—Near Baltimore, 1867, R. V. LeRoy; Howard Co., Patapsco Valley, 1881, J. D. Smith; Garrett Co., 1885, J. D. Smith. *Virginia*.—Salt Pond Mt., 1890, A. Brown and others.

North Carolina.—Asheville, 1886, Thos. Hogg. "Mts. of Carolina and Georgia," S. B. Buckley. *Kentucky*.—Barrens of Green River, C. W. Short. *Tennessee*.—Cumberland Mts., 1842, Rugel. *Illinois*.—Menard Co., Mr. Hall; "Upper Mississippi," 1830, A. B. Eaton; "Franklin's Journey," Dr. Hooker, Herb. Torrey.

Gronovius' specimens on which the species is based in Herb. Mus. Brit. N. L. B.

Var. *LATIFOLIA*, Torr. and Gray, Fl. N. A., i. 131, (1838).

Leaves ovate-lanceolate or elliptical, acuminate, tapering at the base, 2'-4' long, 1'-1½' broad, margin serrulate.

Pennsylvania.—Delaware Co., 1863, 1873, Wm. M. Canby; Chaddsford, 1863, 1878, ex Herb. Wm. M. Canby. *Virginia*.—Bedford Co., 1871, A. H. Curtiss, (a peculiar form with lower leaves like the type and upper leaves like the variety).

Kentucky.—Cliffs of Kentucky River, 1834, Dr. Robert Peter; 1857, Dr. C. W. Short; Shakertown, Dr. C. W. Short, (type); Cliffs of Elkhorn, near Frankfort, 1861, Dr. C. W. Short. *Tennessee*.—Currey, Wilkinson; Cumberland Mts., above Montgomery, 1842, Rugel. "Alleghany Mts." 1831, Herb. H. H. Eaton.

Type in Herb. Acad. Nat. Sci. Phila.

23. *P. ALBA*, Nutt. Genera, ii. 87, (1818).

P. Seneca, var. *tenuifolia*, Pursh, 750, (1814), not *P. tenuifolia*, Willd.

P. bicolor, H. B. K. Nov. Gen. v, 394, t. 507, (1821).

P. Torreyi, Don, Gardener's Dict., i. 360, (1831).

P. Beyrichii, Torr. and Gray, Fl. N. A. i. 130, (1838).

P. scoparia, Benth. Pl. Hartw. 8, (1839), not H. B. K.

P. aparinoides, Hook. and Arn. Bot. Beechey, 277, (1841)
fide Seemann.

Glabrous throughout; stems several or many from a woody rootstock, erect or ascending, straight or somewhat curved, angled or grooved, 6'-18' high, in most cases simple, occasionally sparingly branched above; leaves alternate, acute, linear, linear-lanceolate or linear-subulate, $\frac{1}{2}$ '-1' long, or in some cases a few of the lower ones 2"-3" long, oblanceolate, in apparent whorls; spikes conical, in some cases racemose, often long-peduncled, 2"-3" in diameter at base, $\frac{1}{2}$ '-2' long; bracts deciduous, the axis of inflorescence at length often much elongated, scarred; flowers white, on pedicels about $\frac{1}{2}$ " long; wings obovate or oval, 1"-1 $\frac{1}{2}$ " long; crest of keel fimbriate, the processes rather long and narrow; stamens eight in number; style short, minutely auriculate above the middle and above the pedicelled stigmatic gland, terminating above in a filiform, minutely tufted appendage; mature capsule more or less ovoid, 1"-1 $\frac{1}{2}$ " long; seeds obovoid, hardly curved, covered with appressed silky hairs, the two carunclelobes about half as long as the seed.

Louisiana.—1842, Dr. C. W. Short, (dist. as *P. leptocaulis*, T. and G.); Bradbury, (dist. as *P. Seneca*, var. *tenuifolia*, probably Pursh's specimen). *Arkansas*.—ex Herb. Beyrich. *Missouri*.—Nuttall, (type); "Upper Missouri," 1853, Dr. Suckley; "Upper Missouri," 1874, Dr. Cowes; "Banks of Missouri," 1839, Nicollet's N. W. Exped., Chas. A. Geyer, No. 253. *Texas*.—Wright; 1844, F. Lindheimer, No. 220; Drummond, No. 27; Austin, Drummond, No. 4; Fort Worth, 1877, Reverchon, No. 709; 1880, J. Reverchon, No. 64; "Prairies along the Rio Grande," 1844, Dr. Meyer; Tom Green Co.,

1879, 1880, Frank Tweedy; "Western Texas to El Paso, New Mexico," 1849, C. Wright, No. 99.

New Mexico.—1847, A. Fendler, No. 110; 1851, C. Wright; Santa Magdalena Mts., 1881, G. R. Vasey; near Silver City, 1880, Ed. L. Greene; "Leavenworth to El Paso," F. A. Diffenderffer, Herb. Porter. "Mexican Bound. Survey," Dr. C. C. Parry and others, No. 192.

Kansas.—1884, Dr. J. H. Oyster; Fort Wallace, 1867, Dr. Wm. Bell; Ellis, 1874, L. Watson.

Nebraska.—1888, Dr. Wilcox; Crowelton, E. H. Miller, Herb. Wm. M. Canby. *Dakota*.—Herb. Phila. Acad. Sciences; "Prairies," 1883, Herb. University of Minn; Black Hills, 1887, Dr. W. H. Forwood; "Lit. Missouri River," 1882, Wm. M. Canby. *Arizona*.—Lemmon; "Rio Cienega, East of Tucson," 1877, E. L. Greene, No. 1079; Willowspring, 1874, Dr. Rothrock, No. 207; Fort Verde, Dr. Mearns, No. 327; "30 miles west of Big Spring," 1883, Holstein.

Washington.—"Columbia Plains," Nuttall. Lt. Beckwith's exped., No. 64. Long's 1st exped., Dr. James. "On the Platte," Dr. Le Conte.

24. *P. SCOPARIA*, H. B. K. Nov. Gen. v., 399, (1821).

P. scoparia, var. *multicaulis*, Gray, Pl. Wright. i. 38, (1852).

Stems, several or many from a thick rootstock, erect, 4'-18' high, straight or somewhat curved, irregularly branching, glabrous or more or less puberulent; leaves alternate, subulate-linear, 3"-6" long, nearly erect; racemes $\frac{1}{2}$ '-1 $\frac{1}{2}$ ' long; bracts deciduous; flowers greenish-white; wings about 1" long, obovate or oval, narrowed below into a short claw; crest of keel made up of a few filiform processes; stamens eight in number; style short, open above and minutely auriculate between the stigmatic gland, which is provided with a few minute hairs, and the sessile tuft, the appendage wanting; mature capsule long-ovoid or oblong-ovoid, somewhat compressed, about 2" long, usually provided with an indistinct wing on one margin from base to tip, most easily seen near the tip, the two cells usually unequal, the larger one being

that with the winged margin; seeds almost straight, short-clavate, minutely hairy, that in the larger cell somewhat larger, the two caruncle-lobes narrow, curved, flexuous, those of the larger seed about half as long as the seed, those of the smaller seed shorter.

Texas.—"Western Texas to El Paso, N. Mexico," 1849, Charles Wright, No. 100, (type of *P. scoparia*, var. *multicaulis*, Gray); "El Paso," 1881, G. R. Vasey, (No. 39)?; "Summit of Organ Mts." 1881, J. G. Lemmon.

New Mexico.—1851, C. Wright, No. 934; "Guadalupe Pass, Sonora," 1852, No. 934. *Arizona*.—Oak Creek, 1883, H. H. Rusby, No. 526; Foothills of the Santa Rita Mts., 1884, C. G. Pringle; "near Benson," 1880. Mexican Bound. Survey, Dr. C. C. Parry and others, No. 193.

25. *P. HEMIPTEROCARPA*, A. Gray, Pl. Wright. ii. 31, (1853).

Glabrous, or somewhat puberulent below; stems, often many from the same woody rootstock, erect, striate or angled, 6'-2° high, usually sparingly branched above, branches fastigate; leaves alternate, mostly erect, subulate-linear, acute, ¼'-1' long; racemes 1'-4' long, often loosely flowered toward the base; bracts deciduous; flowers whitish, at length pendulous; wings 1"-2" long, obovate or oval, narrowed into a short claw at the base, much shorter than the mature capsule; crest of keel made up of several thickish processes; stamens eight in number; style much as in the preceding species; mature capsule compressed, oblong-ovoid, 2"-2½" long, the upper cell larger and furnished with a conspicuous wing on the margin from base to tip, which in some cases is almost ½" broad; seeds straight, clavate, hairy, unequal in size, that in the larger cell larger, its two caruncle-lobes long, narrow, curved, flexuous, about two-thirds the length of the seed, that in the smaller cell smaller, apparently undeveloped, its two caruncle-lobes very short.

Texas.—"Dist. by P. V. LeRoy." *New Mexico*.—1851, C. Wright, No. 937, (type). *Arizona*.—Santa Rita Mts., 1884, C. G. Pringle, (dist. as *P. alba*, Nutt. or *P. scoparia*, H. B. K.);

Southern Arizona, 1881, Lemmon, No. 501; Huachuca Mts., 1882, Lemmon, No. 2640; Mex. Bound. Survey, "near Camp Bache," 1852, C. C. Parry and others, (No. 194)?

Type in Herb. Gray.

The two species just described, *scoparia* and *hemipterocarpa*, are much alike; *hemipterocarpa* is a taller and stouter plant, its racemes are longer, its capsules somewhat larger with a large, well developed half-wing which is very small in the other plant; the two plants, however, have nearly the same range, and it is not easy to resist the impression that, in treating of the two, we are dealing with but one species.

26. *P. POLYGAMA*, Walter, Fl. Car. 179, (1788) ex descr.

P. rubella, Willd. Spec. Pl., iii. 875, (1800).

Glabrous throughout; stems several or many, 4'-20' high, ascending, leafy, more or less striate, usually simple; leaves numerous, alternate, the lowest spatulate, a few lines long, the rest spatulate, oblanceolate or oblong, $\frac{1}{2}$ '-1' long, usually mucronate, (in one specimen examined the upper leaves were narrowly oblong-obovate, 5" broad); racemes loosely several to many-flowered, 1'-5' long; flowers rose-purple, or, in forma *pallida*, pale pink, the lower ones at length pendulous on pedicels 1"-1 $\frac{1}{2}$ " long, wings obovate, 2"-3" long, longer than the corolla, venose, the two wings often unequal in size, crest of keel made up of several rather large, branched, somewhat winged processes; stamens eight in number; style short, dilated and cucullate, stigmatic gland pedicelled, tufted appendage short and strongly curved towards the stigmatic gland; mature capsule ovoid to oblong-ovoid, rather more than 1" long; seeds thick, obovoid or ovoid, not curved, very hairy, the two caruncle-lobes conspicuous, parallel, broad, lace-like, almost $\frac{3}{4}$ the length of the seed. Inconspicuous, colorless, but fertile flowers are often borne on short prostrate stems which are sometimes subterranean.

Canada.—Ontario, near Castleton, 1865, Macoun; near Toronto, 1877, Macoun, (No. 374)? *Maine*.—Orono, 1890, M. L. Fernald. *Massachusetts*.—Plymouth, Oakes; N. Truro,

1887, S. Watson; Nantucket, 1885, J. H. Redfield; Sconset, 1890, Mrs. Hubert; Martha's Vineyard, Edgartown, 1885, J. H. Redfield.

Rhode Island.—1846, Thurber and Calder; Smithfield, 1867, ex Herb. Olney; Block Island.

New York.—Oneida Lake, Dr. Torrey; Long Island, Montauk Point, 1865, Dr. T. Green; near Montauk Point, Cooper; Wading River, 1877, E. S. Miller; Hicksville Plain, 1890, Geo. D. Hulst; Cedar Hurst, 1886, J. A. Bisky; Garden City, 1886, Thos. Hogg. *New Jersey*.—Deal; Longacoming, 1862, Herb. Wm. M. Canby; Culver's Gap, 1886, N. L. Britton. *Pennsylvania*.—Near Philadelphia, 1844, ex Herb. Dr. G. Watson; West Philadelphia, "ex Herb. Coultas."

Maryland.—"Sandy Landing below Gt. Falls," 1879, Lester F. Ward. *West Virginia*.—Grafton, 1878, G. Guttenberg, (upper leaves 5" broad).

South Carolina.—Santee Canal, H. W. Ravenel; Bluffton, Beaufort District, 1887, Dr. J. H. Mellichamp; Society Hill, 1878, Herb. Wm. M. Canby, a tall specimen, almost two feet high. *Georgia*.—Boykin, LeConte; Atlanta, 1869, Wm. M. Canby; Rock Mts., 1846; Macon, Mr. Loomis. *Florida*.—Chapman, Dr. Alexander; St. John's Co., 1882, J. D. Smith; Miami, 1877, Dr. A. P. Garber; New Smyrna, 1874, Dr. Edw. Palmer, No. 33. *Alabama*.—Miss R. L. P., Herb. C. W. Short, M. D. *Louisiana*.—Hale, ex Herb. C. Mohr; New Orleans, Dr. Ingalls. *Texas*.—1835, Drummond; 1836, Drummond, ex Herb. Shuttleworth, No. 24; (Bragos ?), 1844, Lindheimer; Hemstead, 1872, Elihu Hall, No. 94.

Illinois.—Dixon, "ex coll. Dr. Vasey." *Wisconsin*.—Juneau Co., Camp Douglas, 1890, E. A. Mearns, No. 251; Lank Co., 1861, "ex coll. T. J. Hale." *Michigan*.—Fort Gratiot, Dr. Pitcher.

Forma PALLIDA, Hollick, Bull. Torr. Club, xviii. 256, (1891). Nantucket, 1885, J. H. Redfield. Long Island, Montauk Point, 1890, Arthur Hollick.

27. *P. PAUCIFOLIA*, Willd. Spec. Pl. iii. part 2, 880, (1800).

P. uniflora, Michx. Fl. ii. 53, (1803).

P. purpurca, Ait. f. Hort. Kew, iv. 244, (1812).

Triclisperma grandiflora, Raf. Speech. i. 117, (1814), fide Raf. Journal de Physique, lxxxix. 258, (1819).

Glabrous below; stems usually several, 2'-8' high, slender, erect or ascending, striate, in most cases simple, arising from slender, creeping, often subterranean stems which often bear inconspicuous but fertile flowers; leaves alternate, all except the uppermost scattered, 1"-5" long, the smallest bract-like; the uppermost 3-6 in number, clustered at the summits of the stems, ovate, oval or elliptical, acute, sometimes mucronate, $\frac{3}{4}$ '-1 $\frac{1}{2}$ ' long, narrowed into a petiole 1"-3" long, the upper portions of the stems, also the petioles, mid-veins and margins of the leaves often puberulent; flowers rose-purple, or, in forma *alba*, white, large, 6"-9" long, showy, 1-4, axillary, but apparently in a terminal cluster, pedicels 5"-6" long; wings obovate, attenuate at the base, venose, rather more than $\frac{1}{2}$ ' long, almost as long as the corolla; lateral petals oblong, concave; crest of keel conspicuous, fimbriate; stamens six in number; style long, enlarging slightly from below upwards, not cucullate or auriculate, without appendage, curved toward the tip which is slightly dilated and its margin denticulate, glabrous; mature capsule glabrous, compressed, somewhat circular in outline and retuse, or obcordate, about 3" long; seeds hairy, caruncle-lobes two or three, subulate, in some cases longer than the seed.

Canada.—Lake Winnipeg Valley, 1837, Bourgeau; Ontario, near Trenton, 1870, Macoun; Missinaibi River, 1887, A. P. Low; New Brunswick, St. Stephen, 1881, Vroom; Ottawa Valley, Chalk River, 1884, Macoun.

Maine.—Raymond, J. Blake; Mt. Desert Island, 1888, Greenleaf, Lane and Rand; Orono, 1890, M. L. Fernald. *New Hampshire*.—North Conway, 1874, Morong; Centre Harbor, 1881, Joseph Schrenk; Belknap Co., 1863, 1864, J. Blake; Wilton, 1889, E. G. Britton. *Vermont*.—Miss Hapgood. *Massachusetts*.—H. Little; Westfield, Mr. Scott; Man-

chester, Oakes; Milton, 1875, Geo. E. Davenport. *Connecticut*.—East Hartford. *Rhode Island*.—Cumberland, Olney.

New York.—Watertown, 1834, Dr. Gray; Long Island, Sag Harbor; Glen Cove, 1876, Herb. J. Schrenk. *Pennsylvania*.—Mts., Wm. Darlington; Altoona, 1862, Herb. Wm. M. Canby; Huntingdon Co., Thos. C. Porter; Sullivan Co., 1864, Charles E. Smith; Monroe Co., Water Gap, 1870, Knipe; Centre Co., 1868, Rothrock; Lehigh Co., 1867, Garber; Huntingdon Co., Short Mts., 1844; Chester Co., 1861 and 1887, J. J. Carter; Tioga Co., Wellsboro, 1869, A. P. Garber; Northampton Co., Mt. Bethel, 1867, Dr. Meisell. *New Jersey*.—Washington, 1868, A. P. Garber; Franklin, 1890, H. H. Rusby; near Washington, 1868, Thos. C. Porter; Newfoundland, 1882, Herb. Jos. Schrenk. *Delaware*.—Mt. Cuba, 1890, Dr. J. B. Brinton. *Maryland*.—Garrett Co., 1878, J. D. Smith. "Yellowstone Park or Valley," 1888, Dr. Chas. H. Hall; "Alleghanies," 1832, Drummond, ex Herb. Shuttleworth.

Forma ALBA. Flowers white. *Pennsylvania*.—Pinegrove, 1860, J. R. Stauffer.

28. P. LINDHEIMERI, A. Gray, Bost. Journ. Nat. Hist. vi. 150, (1857).

Pubescent, or in some cases merely puberulent; stems, several or many from a thick woody root, erect or ascending, 2'-12' high; leaves numerous, alternate, sessile or with very short petioles, somewhat coriaceous, reticulately veined, cuspidate, 4"-9" long, the lowest obovate, the rest ovate, oval, elliptical or lanceolate, more or less pubescent or puberulent, minutely glandular; flowers in loose, few-flowered racemes which are terminal, or at length lateral, the rachis slender, more or less geniculate, with a persistent cluster of three bracts, one larger and two smaller, at each angle, pedicels very short, wings about 2½" long, oval-obovate, venose, about as long as the keel, lateral petals long, narrow, sometimes emarginate or mitten-shaped above, somewhat concave, reaching to the tip of the beak of the keel, keel cucullate and provided with a

slender, hardly curved beak about $\frac{1}{2}$ " long; stamens eight, or in some cases seven, in number, filaments connected almost to the anthers, somewhat dilated near the anthers; ovary pubescent; style long, slender, flexuous, curved above, neither auriculate nor cucullate, somewhat dilated near the tip which has a minutely denticulate margin; mature capsule compressed, oblong-ovoid, 3" or more long, slightly emarginate, puberulent, the upper sepal a little removed from the rest of the flower and often persistent; seeds obovoid, somewhat compressed, covered with dense, spreading hairs, the two caruncle-lobes narrow, rather more than half as long as the seed.

Texas.—Charles Wright; 1846, Lindheimer; 1847-1848, Lindheimer, No. 333, (type); Blanco, J. Reverchon, No. 63; near Comanche, 1877, Reverchon, No. 708; Austin, 1872, Elihu Hall; Fort Stockton, 1860, Patrick Duffy; Western Texas, 1851-1852, C. Wright, No. 1349; Maxon Spring, 1883, Havard, No. 100; Western Texas to El Paso, New Mexico, 1849, Charles Wright, No. 102. *New Mexico*.—1851-1852, C. Wright, No. 1349. "Mexican Boundary Survey," C. C. Parry and others, No. 190. "Upper Guadalupe," 1845, Nos. 337 and 500. "Eagle Pass and Rio Grande," 1848, Wright.

Type in Herb. Gray.

Var. *PARVIFOLIA*, n. var.

Puberulent; leaves all about the same size, small, elliptical or narrowly lanceolate, 3"-4" long; mature capsule smaller and, especially, shorter than in the type.

Arizona.—Foothills of the Santa Rita Mts., 1884, C. G. Pringle, ex Herb. J. D. Smith.

29. *P. TWEEDYI*, Britton, n. spec.

Puberulent throughout; stems, several from a curved or twisted root-stock, 8' high, or less, slender, erect or ascending, more or less curved, leafy to the top, in most cases simple; leaves alternate, erect, sessile, $\frac{1}{2}$ '-1' long, linear to linear-lanceolate, acute, or the lowest oblanceolate; flowers small, about 2" long, few, rachis slightly geniculate, resembling somewhat that in the preceding species, wings obovate, some-

what concave, venose, about as long as the corolla, keel provided with a slender beak about $\frac{1}{2}$ " long, stamens, in the only flower examined, 6, or perhaps 7, filaments united half way to the anthers; style long, rather slender, curved, neither cucullate, auriculate nor dilated, stigmatic gland terminal, somewhat bilabiate; mature capsule about $2\frac{1}{2}$ " long, compressed, longer than broad, puberulent; seeds compressed-obovoid, hairy, two of the three caruncle-lobes cartilaginous, diverging, about half as long as the seed, the third very short.

Texas.—Tom Greene Co., 1879, Frank Tweedy, (type). Perhaps also a plant in Herb. Canby, almost glabrous, about 6' high, "ex Herb. Gray, Gray, Pl. W.," (dist. as *P. puberula*), and another, also in Herb. Canby, "Texas, dist. by P. V. Le Roy," (dist. as *P. Lindheimeri*, Gray).

Type in Herb. Col. Coll.

30. *P. ACANTHOCLADA*, A. Gray, Proc. Am. Acad. xi. 73, (1876).

More or less cinereous-pubescent, almost shrubby, two feet or less in height, the branchlets terminating in slender spines which are sometimes compound; leaves linear-spatulate or linear-oblongate, 3"-6" long, alternate, scattered; flowers subaxillary, few, white, or whitish, about 2" long, the bracts at the base of each pedicel two in number, wings obovate, keel short, cucullate, with a short, conical, blunt beak, or, in some cases, the beak represented by a mere ridge.

Colorado or Utah.—San Juan River, 1875, T. S. Brandegee, (type). *Colorado*.—"On the San Juan, near the Utah line," 1875, T. S. Brandegee, No. 1172, Herb. Porter. *Arizona*.—S'ta. Catalina Mts., 1881, J. G. Lemmon, No. 601. *Nevada*.—Esmeralda Co., Candilaria, 1881, W. H. Shockley.

Type in Herb. Gray.

31. *P. SUBSPINOSA*, S. Watson, Am. Nat., vii. 299, (1873).

Glabrous or somewhat pubescent; stems numerous, 2'-8' high, branched above, the branches usually spinose; leaves alternate, scattered, in most cases few, spatulate, oblong or

linear-lanceolate, $\frac{1}{2}$ '-1' long, obtuse or acute; flowers few, in a loose raceme, wings oblong, 4"-5" long, rose-colored, lateral petals linear, as long as the keel, keel cucullate, yellowish, provided with a thick, blunt beak which is rather short and not erect; capsule obovate, emarginate, about 3" long; seeds hairy.

Nevada.—Near Silver City, 1862, Kellogg, (type). *Southern Utah*.—1873, Capt. Bishop; Kanab, Mrs. Thompson; "Southern Utah, etc.," 1874, Dr. C. C. Parry, No. 32; "Southern Utah, Northern Arizona, etc.," 1877, Dr. E. Palmer, No. 50.

Type in Herb. Gray:

32. P. RUSBYI, Greene, Bull. Torr. Bot. Club, x. 125, (1883).

Hoary-pubescent; low; stems, several or many from a woody rootstock, 2'-6' long, rather stout, branching, spreading, reclining or decumbent, leafy, without spines; leaves alternate, numerous, nearly or quite sessile, 3"-8" long, canescent, the largest about 3" broad, elliptical, or obovate-elliptical, in most cases acute; racemes loosely 4-8 flowered, bracts scarious-margined, ciliate, pedicels 2"-3" long; flowers showy, 4"-5" long, the lowest often pendulous, wings somewhat concave, narrowly obovate or oblong, venose, flesh-colored or purplish, somewhat longer than the keel, lateral petals often longer than the keel, narrow, venose, in some cases retuse, keel yellowish, provided with a rather large, almost straight, blunt beak; stamens eight in number, anthers emarginate at summit; style long, curved, broadening somewhat above, neither cucullate nor auriculate, stigma indistinctly bilabiate, the lower lip often minutely bearded beneath.

Arizona.—1870, Dr. Palmer; near Prescott, 1883, H. H. Rusby, (type); Prescott, 1876, Dr. E. Palmer, No. 34, (dist. as *P. subspinosus*, Watson); Peach Springs, 1884, J. C. Lemmon; Marcus E. Jones, (dist. as *P. subspinosus*, Watson); Banghart's Rancho, 1883, H. H. Rusby, No. 525; Fort Verde, Dr. E. A. Mearns, (No. 323 ?).

The above species is referred to, in the original descrip-

tion of *P. subspinos*a, Watson, as a densely pubescent but spineless form of the same.

Authentic specimen in Herb. Col. Coll.

33. *P. CUCULLATA*, Benth. Pl. Hartw. 299, (1849).

P. Californica, Nutt., Torr. and Gray, Fl. i. 671, (1840).

P. Nutkana, Torr. and Gray, Fl. i. 671, (1840).

Glabrous, or puberulent above; stems slender, curved, reclining or ascending, 2'-12' long, simple, or branched above; leaves alternate, glabrous, or puberulent, at least on the mid-vein on the under surface of the leaf, ovate-elliptical, elliptical or oblong-lanceolate, $\frac{1}{2}$ '-1 $\frac{1}{2}$ ' long, acute or obtuse, in some cases cuneate at base, petioles hardly more than $\frac{1}{2}$ " long; flowers rose-colored, few, rarely more than ten, 5"-6" long, in a raceme terminating the stem or branches, pedicels 1"-3" long, sepals minutely ciliate on the margin, otherwise nearly glabrous, wings spatulate, almost as long as the keel, lateral petals linear-lanceolate, as long as, or even longer than the keel; keel bearing a rather conspicuous, stout, curved, blunt beak; stamens eight in number, filaments united for the lower two-thirds of their length, filiform above; style long, rather slender, much curved above, neither cucullate nor auriculate, stigma obscurely bilabiate, minutely bearded on the lower lip; mature capsule glabrous, or nearly so, compressed, oval to ovate, about 4" long, retuse between the tips of the narrow, veined, wing-like margins of the capsule; seeds only slightly hairy, the caruncle-lobes united, somewhat bonnet-shaped, about one-third as long as the seed.

California.—Hartweg, Dr. Gibbons; 1872, Miss Mary J. Bancroft; Santa Cruz, 1865, C. L. Anderson; 1882, C. C. Parry; Monterey, Andrews; 1850, Dr. C. C. Parry; Ukiah, 1864, H. N. Bolander, No. 3917; 1882, C. Purdy; Napa Valley, 1865, J. Torrey, No. 76; near San Francisco, 1865, J. Torrey; Marin Co., 1880, G. R. Vasey, No. 41; Mariposa, 1883, T. Meehan; Summit Mt. Tamaulpais, 1874, J. G. Lemmon, No. 486; Bolinas Bay Hills, 1866, Kellogg, (Geol. Survey of Cal.).

Oregon.—Josephine Co., 1876, L. W. Lee ; Waldo, 1884, Thomas Howell.

34. *P. CORNUTA*, Kellogg, Proc. Calif. Acad., 1. 61, (1855),
fide Greene.

P. Californica, Brew. & Wats. Bot. Cal. i. 59, (1876),
(not Nutt).

Glabrous, or nearly so, 6'–18' high, stout, often much branched ; leaves alternate, almost or quite glabrous, ovate, elliptical, lanceolate, or some of the smaller ones obovate, obtuse and more or less mucronate, or, in some cases, slightly retuse, $\frac{1}{2}$ '–1 $\frac{1}{2}$ ' long, 3"–7" broad, nearly sessile; flowers in racemes terminating the stems, greenish-white, 4"–5" long, pedicels about 2" long; bracts often persisting for some time; in most cases all the sepals tomentose, wings oblong, venose, hardly as long as the keel; keel much as in the preceding species but its beak acicular, erect; lateral petals shorter than in the preceding species, not reaching the tip of the beak; stamens eight in number; style much as in the preceding species; mature capsule compressed, about 5" long, broadly ovate or somewhat circular in outline, retuse or emarginate; seeds densely hairy.

California.—Nuttall, Rev. Mr. Fitch; Santa Barbara Co., 1865, J. Torrey; Los Angeles Co., St. Anita Cañon, 1883, J. C. Nevin, No. 849; Siskiyou Co., 1881, C. G. Pringle; 1876, E. L. Greene, No. 1011; Scott Valley, Callahan's Ranch, 1876, E. L. Greene, No. 1011; Plumas Co., 1875, Mrs. M. E. P. Ames; 1876, Mrs. Ames, Herb. Wm. M. Canby; Butte Co., 1878, Mrs. J. Bidwell; San Diego Co., Jamuel Valley, 1875, Dr. Ed. Palmer, No. 19, (dist. as *P. cucullata*, Benth); "Upper Sacramento," 1838–1842, Herb. U. S. South Pac. Explor. Exped., No. 1595; "Frémont's Exped. to Calif.," 1845–1847; "Geol. Survey of Calif.," 1860–1862, near Mt. Shasta, W. H. Brewer, No. 1369; "Geol. Survey of Calif.," 1866, Rattan; "P. R. R. Surv. Calif. and Oregon, foot of Mt. St. Joseph's," Dr. J. S. Newberry.

35. *P. MACRADENIA*, A. Gray, Pl. Wright., i. 39, (1852).

Cinereous-pubescent; 2'-10' high; stem very stout, woody, twisted, procumbent, much branched; leaves alternate, very numerous, oblong or oblong-lanceolate, 2"-3" long, obtuse, densely cinereous-pubescent, with comparatively large, roundish, black or yellowish-brown glands, more numerous upon the under surface; flowers solitary, scattered, almost sessile; wings 2"-2½" long, obovate or oblong-obovate; lateral petals as long as, or longer than, the keel, narrow, curved near the truncate or retuse tip; keel somewhat three-lobed, naked, without crest or beak; stamens eight in number, filaments united almost to the anthers; style slender, curved above the middle, not dilated, neither cucullate nor auriculate; mature capsule ovate, compressed, about 3" long, emarginate, puberulent; seeds narrowly obovoid, curved, densely appressed-hairy, caruncle helmet-shaped or miter-shaped, with three short, acute lobes

Texas.—1851, Geo. Thurber; C. Wright, No. 101; "Rio Grande," 1848, Wright; El Paso, 1881, G. R. Vasey; 1858, F. Dieffenderffer, No. 76; "Western Texas to El Paso, New Mexico," 1849, Chas. Wright, No. 101. *New Mexico*.—1851—1852, C. Wright, No. 1348. *Arizona*.—Santa Cruz, 1884, W. F. Parish; "Hills near Tucson," 1883, C. G. Pringle; "Camp Grant," 1867, Dr. Ed. Palmer; "Santa Catalina Mts.," 1881, J. G. Lemmon, No. 125.

Type in Herb. Gray.

36. *P. OVALIFOLIA*, A. Gray, Pl. Wright., i. 39, (1852).

Velvety-pubescent; 3'-10' high; stems few or many from a stout, woody base, erect or ascending, flexuous, leafy to the summit, simple or branching; leaves numerous, alternate, 4"-1' long, the lower, smaller ones round-ovate, the larger ovate, oval or ovate-elliptical, the uppermost often ovate-lanceolate, acute, the rest more or less obtuse, though often mucronate, both surfaces, but especially the lower, more or less papillose and pubescent, the margin spreading-ciliate, petioles very short; flowers greenish-yellow, the lower

pendulous, in rather crowded, 12 to 25 flowered racemes terminating the stems and branches; pedicels 1"—2" long; wings about 2½" long, oval, the outer surface pubescent or puberulent, the margin ciliate, shorter than the keel which they do not cover or conceal; lateral petals much shorter than, often only one-half as long as, the keel; keel mostly uncovered, the most conspicuous part of the flower, 3"—4" long, naked, without crest or beak; stamens eight in number; style slender, curved, neither dilated, cucullate nor auriculate, stigma apparently two-lobed and bearded between the lobes which are somewhat separated; mature capsule compressed, almost circular in outline, 5"—6" long, deeply emarginate, surfaces glabrous, margin ciliate; seeds with a short, bonnet-shaped caruncle.

Texas.—Rio Grande, 1848, Wright, (type); "dist. by P. V. Le Roy," in Herb. Canby; Uvalde Co., 1885, J. Reverchon, No. 1492, (dist. as *P. ovalifolia*, D.C.); San Diego, 1884–1888, Miss Mary B. Croft, No. 29; Western Texas, "on the Sabinal," 1885, J. Reverchon, No. 12, (dist. as *P. ovalifolia*, D.C.); Western Texas, 1851, C. Wright, No. 935; "Western Texas to El Paso," 1849, Chas. Wright, No. 103.

New Mexico.—1851, C. Wright, No. 935. Mexican Bound. Survey, C. C. Parry and others, No. 191. *Mexico*.—Monterey, "Edwards and Eat.", (ex Herb. J. Torrey); 1880, Dr. Ed. Palmer, No. 65. Type in Herb. Gray.

This plant was at first taken for *P. ovalifolia*, D.C., by Dr. Gray in Pl. Lindh., ii. 151, but the distinction between the two is clearly indicated by him in Pl. Wright., as above.

P. ovalifolia, D.C., is not pubescent, but puberulent or almost glabrous, the veins on the under surface of the leaves stand out prominently, the racemes are, in most cases, made up of fewer and more erect flowers, the wings are as long as, or even longer than, the keel which they almost conceal, the narrow lateral petals are almost as long as the keel, and, according to DeCandolle, the surfaces of the capsule are pubescent. The only specimens seen by the writer are from Mexico, and, therefore, not within the limits of this paper.

37. *P. PUBERULA*, A. Gray, Pl. Wright. i. 40, (1852).

Puberulent; stems erect or ascending, 6'–18' high, somewhat flexuous, in most cases branched, branches erect; leaves numerous, alternate, linear-lanceolate to lanceolate, $\frac{1}{2}$ '–1' long, almost sessile, puberulent, often mucronate; flowers purplish or bluish, in open, rather few-flowered racemes which may become several inches long, fertilized flowers, and capsules, pendulous, pedicels about 1" long, floral envelopes early deciduous; wings obovate, ciliolate, 2"–3" long, in most cases somewhat appressed to, and almost as long as, the keel; lateral petals broad, obtuse, almost spatulate, in some cases slightly emarginate, considerably shorter than the keel; keel naked, without crest or beak; stamens eight in number, filaments united almost to the anthers; style slender, curved, neither dilated, cucullate nor auriculate, stigma two-lobed, not bearded; mature capsule compressed, oval, or almost circular in outline, emarginate, about 4" long, the surfaces glabrous, or in some cases puberulent, the margin sparsely ciliate, the immature capsule somewhat obovate; seeds obovoid, hairy, the caruncle-lobes forming three lacerate, somewhat curved processes, about one-quarter the length of the seed.

Texas.—P. V. Le Roy; Western Texas, Bofecillos Mts., 1881, V. Havard, No. 102, (18' high, leaves erect, probably *P. puberula*); Foot-hills Bofecillos Mts., 1883, V. Havard, No. 99, and Chisos Mts., 1883, V. Havard, No. 98, (leaves linear, 3"–10" long, perhaps a variety); Western Texas to El Paso, 1849, Chas. Wright, No. 104.

New Mexico.—1851–1852, C. Wright, No. 936, (type); 1851, ex coll. Geo. Thurber, 1871, F. R. Diffenderffer, (probably *P. puberula*); Mangus Springs, 1881, H. H. Rusby, No. 33, and, in Herb. J. D. Smith, Mogollon Mts., 1881, Henry H. Rusby, No. 31, (probably *P. puberula*); "near Silver City," 1880, E. L. Greene.

Arizona.—"Ash Ck.," 1874, Dr. J. T. Rothrock, No. 312; "near Tucson, Sa. Catalina Mts.," 1881, J. G. Lemmon, No. 124; "Camp Bowie," 1874, Rothrock, No. 459; Foot-hills of

Santa Rita Mts., 1882, C. G. Pringle, No. 20; Foot-hills of Santa Rita Mts., 1884, C. G. Pringle; "Bower's Ranch," Dr. Palmer, (probably *P. puberula*); "Beaver Head," 1883, H. H. Rusby, No. 527, (probably *P. puberula*).

Mexican Bound. Survey, C. C. Parry and others, No. 189.
Type in Herb. Gray.

38. *P. GRANDIFLORA*, Walt. Fl. Car. 179, (1788), ex descr.

P. Senega, var. *rosea*, Michx. Fl. ii. 53, (1803).

P. pubescens, Muhl. Cat. 66, (1813).

P. Muhlenbergii, Don, Gard. Dict. i. 358, (1831).

Pubescent; stems several, or in some cases only one, rather slender, 8'-20' high, ascending, slightly curved, simple or branching, leafy to the top; leaves alternate, linear-lanceolate to lanceolate, or some of them almost elliptical, often mucronate, slightly pubescent, especially near the margin, $\frac{1}{2}'$ - $1\frac{1}{2}'$ long, on very short petioles; flowers rose-color or purplish, becoming greenish, scattered, often distant, the lower ones mostly drooping, in elongated racemes, often several inches in length, the recurved pedicels about 2" long; wings persistent, circular-deltoid, comparatively large, 3"-4" broad, short-clawed, glabrous, conspicuously venose, covering and more or less concealing the corolla or the capsule; lateral petals venose, dilated above, or spatulate, much shorter than the keel; keel naked, without crest or beak, more or less plicate at the sides below, cucullate, with sometimes a slight callosity at the tip; stamens eight in number, filaments slender, united only below the middle; style slender, bent near the middle at an acute angle, somewhat dilated below, neither cucullate nor auriculate, minutely bearded for a short distance below the stigma; mature capsule compressed, obovoid or oblong-obovoid, emarginate, $2\frac{1}{2}''$ -3" long, glabrous, or nearly so; seeds oblong-ovoid, somewhat compressed, very hairy, hairs silky, caruncle cartilaginous, helmet-shaped with three short projections, conspicuous.

South Carolina.—Charleston, Dr. Bachman; Society Hill. 1878, Herb. Wm. M. Canby, and 1884, J. D. Smith; Bluffton,

Beaufort Dist., 1873 and 1886, Dr. J. H. Mellichamp. *Georgia*.—Le Conte, Baldwin. *Florida*.—Dr. Torrey, Mr. Ware, Dr. A. W. Chapman, Mrs. Treat, and 1875, Mary C. Reynolds; Indian River, 1874, Dr. Ed. Palmer, No. 31; Hibernia, 1869, Wm. M. Canby; Manatee Co., 1887, Dr. J. T. Rothrock; Fort Meade, 1880, J. D. Smith; Tampa, Bay, 1845, Rugel, No. 39; Tampa, 1880, J. D. Smith; "near Jacksonville," A. H. Curtiss, No. 513; Miami, 1877, Dr. A. P. Garber; Keys, Sarasota, 1876, Dr. A. P. Garber; Key West, Blodgett. *Alabama*.—Gates. *Mississippi*.—Columbus, 1890, S. M. Tracy.

Var. *ANGUSTIFOLIA*, Torr. and Gray, i. 671, (1840).

Leaves linear, almost glabrous, flowers usually somewhat smaller.

Florida.—Dr. Leavenworth, Dr. A. W. Chapman; Lake Astachusa, Sumter Co., 1879, J. D. Smith; "near St. Marks," 1843, Rugel; Key West, 1846, Rugel, No. 37, (dist. as *P. flabellata*, Shuttl.); Miami, 1877, Dr. A. P. Garber; Biscayan Bay, 1874, Dr. Ed. Palmer, No. 32; Pine Key and Key West, Blodgett.

Type in Herb. Col. Coll.

In his *Flora of North America*, Part iv. pp 88-90, (1836), Rafinesque describes seven species under the generic names *Asemcia* and *Polygala*. I have not been able to find authentic specimens of any of them, and his descriptions are not sufficient for their positive identification.

Besides the specimens contained in the Herbarium of Columbia College, there have been examined, in the preparation of this paper, those in the Gray Herbarium at Cambridge, the Herbarium of the Academy of Natural Sciences of Philadelphia, and that of the Geological and Natural History Survey of Canada, and also those in the Herbaria of Prof. Thomas C. Porter, Capt. John Donnell Smith and Mr. Wm. M. Canby.

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